Journal of Accountancy

Volume 53 | Issue 2 Article 6

2-1932

Students' Department

H. P. Baumann

Students' Department

H. P. BAUMANN, *Editor*

AMERICAN INSTITUTE EXAMINATIONS

[NOTE.—The fact that these solutions appear in THE JOURNAL OF ACCOUNTANCY should not cause the reader to assume that they are the official solutions of the board of examiners. They represent merely the opinions of the editor of the *Students' Department.*]

EXAMINATION IN ACCOUNTING THEORY AND PRACTICE—PART I

November 12, 1931, 1:30 P. M. to 6:30 P. M.

The candidate must answer the first three questions and one other question:

No. 3 (35 points):

EXPLANATORY NOTES

A logging company buys timberland (standing timber), cuts it down, saws it into logs and sells the logs.

The timber is first "cruised" by an expert, who reports upon the approximate amount and condition of each kind of timber on each section.

The land may be sold for a lump sum, at so much per acre or so much per thousand feet logged.

Where the land is close to a river, the skidroad process is employed; if too far away from a river, railroads are built. Frequently, the combination process is used.

When a section "goes under the axe," a camp is built, a road cleared and skidroad or railroad, or both, constructed. The cost is spread over the section cleared, as such equipment is worthless when this particular part is exhausted.

The processes employed are felling, bucking (sawing into logs), branding (a different mark being used for each section), logging and hauling—over skidroad, by railroad to landing on river bank, or direct to the mill. If the logs are dumped into a river, a boom, owned generally by an outsider, is necessary for sorting.

The logs, rafted or railroaded to the mill, are then graded and measured by both owner and buyer. As soon as the content of either raft or car is determined, the mill sends the owner (logger) a credit memorandum for it.

PROBLEM

From the following trial balance and explanatory data, prepare

(a) Balance-sheet, as of December 31, 1930.
(b) Statement of operating cost for the year ended December 31, 1930.
(c) Statement of profit and loss for the same period.

SAMOSET LOGGING COMPANY—CAMP NO. 1

Trial balance—December 31, 1930

	DR.	CR.
Cash in bank	$422,500	
Petty cash	1,750	
Accounts receivable	165,450	
Inventories:		
Cook-house	250	
Wangan*	150	
Standing timber (stumpage)	157,800	
Clearing cost	2,400	
Machinery and equipment	22,400	
Tools	1,250	
Cable	8,200	
Skidroads	29,000	
Office fixtures	1,500	

*Wangan—A flatboat used by Maine lumbermen for transporting their tools and provisions.

	Dr.	Cr.
Notes payable		$ 50,000
Accounts payable		18,750
Payrolls accrued		37,100
Bonds—6 per cent		100,000
Capital stock		500,000
Labor	$59,400	
Rigging maintenance	4,850	
Sundry operating expenses	900	
Cook-house purchases	12,350	
Cook-house sales		15,250
Wangan purchases	1,210	
Wangan sales		1,320
Log sales		185,200
Salaries—administrative	10,000	
Office expenses	2,550	
Sundry expenses—general	710	
Bond interest	3,000	
	$907,620	$907,620

A survey of the situation, and an analysis of the records, produced the following information:

(1) There was no inventory of logs on hand, January 1, 1930, either in wood or in water.
(2) The cruiser's estimate of the tract contents was 60,000,000 feet.
(3) During the year, 26,040,000 feet were logged and 25,470,000 feet were rigged (placed in heaps or piles).
(4) Inventories, December 31, 1930, were:

Cook-house	$ 300
Wangan	160
Logs in water	2,320,000 feet

(5) Logs sold, 23,150,000 feet.
(6) Labor account was analyzed as follows:

Felling and bucking	$17,100
Rigging	36,550
Cook-house	3,540
Wangan	2,210
	$59,400

(7) Bond interest is payable semi-annually, July 1st and January 1st, and the dividend declared is 3 per cent.

The brand used in this instance was S L—1.

Fixed assets are to be written off in proportion to footage handled. Equipment depreciation is to be considered as a general expense. Tools are to be written off to felling and bucking, and cable wear-and-tear to rigging.

Solution:

This problem is subject to several different solutions, depending upon the treatment of such items as the net cost of operating the wangan and cook-house, the depreciation on the machinery and equipment, and the difference of 570,000 feet of logs cut, but not rigged.

In this solution, the net cost of operating the wangan and the cook-house is considered as an operating cost, although it may be assumed to be applicable to the entire operations of the camp, including sales and administration.

The depreciation on machinery and equipment is treated as a general expense, as the problem states that "equipment depreciation is to be considered

as a general expense." It is possible that some candidates would ignore the requirement of the examiners and apply the depreciation on this asset to the cost of operations.

Under (3), it will be noted that of the 26,040,000 feet logged during the year, 25,470,000 feet were rigged (placed in heaps or piles). In the following solution, the difference of 570,000 feet is shown as an inventory of logs felled and bucked—that is, cut, but not placed in heaps or piles. It is possible that some candidates will consider these 570,000 feet as waste.

EXPLANATORY ADJUSTMENTS

(1)

Labor:		
Felling and bucking	$17,100.00	
Rigging	36,550.00	
Cook-house	3,540.00	
Wangan	2,210.00	
Labor		$59,400.00
To distribute the labor account.		

(2)

Bond interest	3,000.00	
Bond interest accrued		3,000.00
To set up the accrued liability for bond interest coupons due January 1, 1931, of 3% on the $100,000 bonds outstanding at December 31, 1931.		

(3)

Surplus	15,000.00	
Dividends payable		15,000.00
To record the declaration of the 3% dividend on the $500,000 of capital stock outstanding.		

(4)

Depreciation:		
Tools	542.50	
Cables	3,480.90	
Skidroads	12,310.50	
Machinery and equipment	8,642.67	
Office furniture and fixtures	578.75	
Reserves for depreciation:		
Tools		542.50
Cables		3,480.90
Skidroads		12,310.50
Machinery and equipment		8,642.67
Office furniture and fixtures		578.75
To set aside depreciation for the year on the basis of logs handled.		

The problem requires that the fixed assets be written off in proportion to the footage handled. The depreciation to be charged for the year is, therefore,

	Total cost of 60,000M feet	Footage handled	Proportion	Depreciation
Tools	$ 1,250.00	26,040M	43.4%	$ 542.50
Cables	8,200.00	25,470M	42.45%	3,480.90
Skidroads	29,000.00	25,470M	42.45%	12,310.50
Machinery and equipment	22,400.00	23,150M	38.583%	8,642.67
Office furniture and fixtures	1,500.00	23,150M	38.583%	578.75

It should be noted in the solution that the depreciation on the machinery and equipment of $8,642.67 is considered as a general expense in the profit-and-loss statement as required by the problem. It would seem that this depreciation should be treated as a cost.

(5)

Stumpage used	$68,485.20	
Clearing cost amortized	1,041.60	
Standing timber (stumpage)		$68,485.20
Clearing cost		1,041.60

To charge operations with the proportion of stumpage and clearing cost used during the year on the basis of logs cut.

	Total cost (60,000M ft.)	Cost of logs cut (26,040M ft.)
Stumpage	$157,800.00	$68,485.20
Clearing cost	2,400.00	1,041.60

(6)

Inventory of logs—felled and bucked	1,908.08	
Inventory of logs—in water	13,301.75	
Cost of operations		15,209.83

To set up the inventories of logs felled and bucked, and in water (exhibit C).

(7)

Cost of operating wangan	2,090.00	
Wangan sales	1,320.00	
Inventory—wangan—December 31, 1930	160.00	
Inventory—January 1, 1930		150.00
Purchases		1,210.00
Labor		2,210.00

To record the net cost of operating the wangan for the year 1930 (schedule I).

SAMOSET LOGGING COMPANY—CAMP NO. 1
Working papers—December 31, 1930

	Trial balance December 31, 1930		Adjustments		Cost of operations	Profit and loss	Balance-sheet	
Cash in bank	$422,500.00						$422,500.00	
Petty cash	1,750.00						1,750.00	
Accounts receivable	165,450.00						165,450.00	
Inventory—cook-house	250.00		(8) $ 300.00	(8) $ 250.00			300.00	
Inventory—wangan	150.00		(7) 160.00	(7) 150.00			160.00	
Standing timber (stumpage)	157,800.00			(5) 68,485.20			89,314.80	
Clearing cost	2,400.00			(5) 1,041.60			1,358.40	
Machinery and equipment	22,400.00						22,400.00	
Tools	1,250.00						1,250.00	
Cables	8,200.00						8,200.00	
Skidroads	29,000.00						29,000.00	
Office fixtures	1,500.00						1,500.00	
Notes payable		$ 50,000.00						$ 50,000.00
Accounts payable		18,750.00						18,750.00
Payrolls accrued		37,100.00						37,100.00
Bonds—6%		100,000.00						100,000.00
Capital stock		500,000.00						500,000.00
Labor	59,400.00			(1) 59,400.00				
Rigging maintenance	4,850.00				$ 4,850.00			
Sundry operating expenses	900.00				900.00			
Cook-house purchases	12,350.00			(8) 12,350.00				
Cook-house sales		15,250.00	(8) 15,250.00					
Wangan purchases	1,210.00			(7) 1,210.00				
Wangan sales		1,320.00	(7) 1,320.00					
Log sales		185,200.00				$185,200.00		
Salaries—administrative	10,000.00					$ 10,000.00		
Office expenses	2,550.00					2,550.00		
Sundry expenses—general	710.00					710.00		
Bond interest	3,000.00		(2) 3,000.00			6,000.00		
	$907,620.00	$907,620.00						

Labor:										
Felling and bucking ...	(1)	17,100.00			17,100.00					
Rigging	(1)	36,550.00			36,550.00					
Cook-house	(1)	3,540.00	(8)	3,540.00						
Wangan	(1)	2,210.00	(7)	2,210.00						
Bond Interest accrued ...			(2)	3,000.00						3,000.00
Inventory of logs—felled and bucked	(6)	1,908.08							1,908.08	
Inventory of logs in water	(6)	13,301.75							13,301.75	
Dividends payable			(7)	15,000.00						15,000.00
Cost of operating wangan	(7)	2,090.00			2,090.00					
Cost of operating cook-house	(8)	590.00			590.00					
Depreciation:										
Tools	(4)	542.50			542.50					
Cables	(4)	3,480.90			3,480.90					
Skidroads	(4)	12,310.50			12,310.50					
Machinery and equipment	(4)	8,642.67					8,642.67			
Office furniture and fixtures	(4)	578.75					578.75			
Reserves for depreciation:										
Tools			(4)	542.50						542.50
Cables			(4)	3,480.90						3,480.90
Skidroads			(4)	12,310.50						12,310.50
Machinery and equipment			(4)	8,642.67						8,642.67
Office furniture and fixtures			(4)	578.75						578.75
Stumpage used	(5)	68,485.20			68,485.20					
Clearing cost amortized..	(5)	1,041.60			1,041.60					
Cost of operations.....			(6)	15,209.83		$15,209.83 132,730.87	132,730.87			
Profit and loss (surplus) ..	(3)	15,000.00					23,987.71			8,987.71
Total		$207,401.95		$207,401.95	$147,940.70	$147,940.70	$185,200.00	$185,200.00	$758,393.03	$758,393.03

(8)

Cost of operating cook-house	$ 590.00	
Cook-house sales	15,250.00	
Inventory—cook-house	300.00	
Inventory—January 1, 1930		$ 250.00
Purchases		12,350.00
Labor		3,540.00

To record the cost of operating the cook-house for the year 1930 (schedule II).

Schedule I

SAMOSET LOGGING COMPANY—CAMP NO. 1

Statement of cost of operating wangan for the year ended December 31, 1930

Materials and supplies:		
Inventory—January 1, 1930	$ 150.00	
Purchases	1,210.00	
Total	$ 1,360.00	
Less—inventory, December 31, 1930	160.00	
Materials and supplies used		$ 1,200.00
Labor		2,210.00
Total cost		$ 3,410.00
Less—wangan sales		1,320.00
Cost of operating wangan		$ 2,090.00

Schedule II

STATEMENT OF COST OF OPERATING COOK-HOUSE

For the year ended December 31, 1930

Materials and supplies:		
Inventory, January 1, 1930	$ 250.00	
Purchases	12,350.00	
Total	$12,600.00	
Less—inventory, December 31, 1930	300.00	
Materials and supplies used		$12,300.00
Labor		3,540.00
Total cost		$15,840.00
Less—cook-house sales		15,250.00
Cost of operating cook-house		$ 590.00

Exhibit A

SAMOSET LOGGING COMPANY—CAMP NO. 1

Balance-sheet—December 31, 1930

Assets

Current assets:			
Cash:			
In bank	$422,500.00		
Petty cash	1,750.00		
		$424,250.00	
Accounts receivable		165,450.00	
Inventories:			
Logs—felled and bucked	$ 1,908.08		
Logs—in water	13,301.75		
Cook-house	300.00		
Wangan	160.00		
		15,669.83	
			$605,369.83
Standing timber:			
Stumpage		$ 89,314.80	
Clearing cost		1,358.40	
			90,673.20

Fixed assets:

	Cost	Reserve for Depreciation	Depreciated Value	
Machinery and equipment	$ 22,400.00	$ 8,642.67	$ 13,757.33	
Tools	1,250.00	542.50	707.50	
Cable	8,200.00	3,480.90	4,719.10	
Skidroads	29,000.00	12,310.50	16,689.50	
Office fixtures	1,500.00	578.75	921.25	
	$62,350.00	$ 25,555.32	$ 36,794.68	36,794.68
				$732,837.71

Liabilities and net worth

Current liabilities:			
Notes payable		$ 50,000.00	
Accounts payable		18,750.00	
Payrolls accrued		37,100.00	
Bond interest accrued		3,000.00	
Dividends payable		15,000.00	
			123,850.00
Bonds—6 per cent.			100,000.00

Net worth:			
Capital stock		$500,000.00	
Surplus—net profit for the year 1930, before provision for federal income taxes	$ 23,987.71		
Dividends paid	15,000.00	8,987.71	508,987.71
			$732,837.71

Exhibit B

SAMOSET LOGGING COMPANY—CAMP NO. 1

Statement of profit and loss for the year ended December 31, 1930

		Amount	Per thousand feet
Sales (23,150M feet)		$ 185,200.00	$8.000
Cost of sales (exhibit C)		132,730.87	5.734
Gross profit on sales		$ 52,469.13	$2.266
Deduct expenses:			
Salaries—administrative	$10,000.00		$ .432
Office expenses	2,550.00		.110
Sundry expenses—general	710.00		.031
Depreciation—equipment	8,642.67		.373
Depreciation—office fixtures	578.75		.025
Total expenses		22,481.42	$ .971
Net profit from operations		$ 29,987.71	$1.295
Deduct—bond interest		6,000.00	.259
Net profit for the year before provision for federal income taxes		$ 23,987.71	$1.036

Exhibit C

SAMOSET LOGGING COMPANY—CAMP NO. 1

Statement of operating cost for the year ended December 31, 1930

	Quantity	Amount	Per thousand feet
Cost of logs felled and bucked:			
Stumpage	26,040M	$ 68,485.20	$2.630
Clearing cost		1,041.60	.040
Depreciation of tools		542.50	.021
Felling and bucking labor		17,100.00	.657
Total	26,040M	$ 87,169.30	$3.348
Deduct—inventory of logs felled and bucked	570M	1,908.08	3.348

Felling and bucking cost of logs rigged	25,470M	$ 85,261.22	$3.348
Rigging maintenance		4,850.00	.190
Rigging labor		36,550.00	1.435
Depreciation of cable		3,480.90	.137
Cost of logs rigged	25,470M	$130,142.12	$5.110
Other operating costs:			
Depreciation of skidroads		12,310.50	.483
Other operating expenses		900.00	.035
Net cost of operating wangan (schedule I)		2,090.00	.082
Net cost of operating cook-house (schedule II)		590.00	.024
Cost of logs rigged and placed in water	25,470M	$146,032.62	$5.734
Deduct—inventory of logs in water	2,320M	13,301.75	5.734
Cost of logs sold	23,150M	$132,730.87	$5.734

No. 4 (10 points):

A certain company has an agreement with its president to pay him a bonus of 10 per cent. of that portion of the net profit, after deduction for federal income tax, which is in excess of 6 per cent. of the invested capital. Invested capital amounts to $300,000.

The profit, before deduction for bonus and tax, was $50,000 and the bonus, to be paid, is a deductible item in computing the tax.

What is the company's net income—i. e., less bonus and tax—and what the true rate of return on investment?

Solution:

Let B equal the bonus

and let T equal the tax.

Since the bonus is to be "10 per cent. of that portion of the net profit, after deduction for federal income tax, which is in excess of 6 per cent. of the invested capital" of $300,000,

$$B = .10(\$50{,}000 - \$18{,}000T) \quad (1)$$

And since the tax is 12 per cent. (corporation rate for the year 1930) of the net profit after deducting the bonus,

$$T = .12(\$50{,}000B) \quad (2)$$

$$\text{or } T = \$6{,}000 - .12B \quad (3)$$

Solving for B:

$$B = .10(\$50{,}000 - \$18{,}000T) \quad (1)$$

$$\text{or } 10B = \$32{,}000T \quad (4)$$

Substituting the value of T in equation (3) for the value of T in the equation (4), we have:

$$10B = \$32{,}000 - (\$6{,}000 - .12B)$$

Removing the parentheses and changing signs:

$$10B = \$32{,}000 - \$6{,}000 + .12B$$

$$10B - .12B = \$32{,}000 - \$6{,}000$$

$$9.88B = \$26{,}000$$

$$B = \$2{,}631.58$$

Solving for T:

$$T=\$6,000-.12B \qquad (3)$$
$$T=\$6,000-.12(\$2,631.58)$$
$$T=\$6,000-\$315.79$$
$$T=\$5,684.21$$

Proof

Computation of tax:	
Net profit before deducting bonus and tax	$50,000.00
Deduct bonus	2,631.58
Taxable net income	$47,368.42
Rate of tax for the year 1930	12%
Tax (12% of $47,368.42)	$ 5,684.21
Computation of bonus:	
Net profit before deducting bonus and tax	$50,000.00
6 per cent. of invested capital of $300,000	18,000.00
Remainder	$32,000.00
Tax	5,684.21
Net profit before bonus	$26,315.79
Bonus (10% of $26,315.79)	$ 2,631.58

While the problem states that the bonus is to be 10 per cent. of the "net profit," and it might well be said that the bonus must be considered as an expense in determining "net profit," it does not seem that the examiners intended that the bonus be treated as an expense in arriving at the amount of the bonus, for "the profit, before deduction for bonus and tax, was $50,000 and the bonus, to be paid, is a deductible item in computing the tax." If it were the intention of the examiners that the bonus be deducted as an expense in ascertaining the amount of the bonus, this point, no doubt, would have been specifically mentioned in the problem.

Computation of the true rate of return on the investment:		
Net profit before deducting bonus and tax		$50,000.00
Deduct:		
Bonus	$ 2,631.58	
Tax	5,684.21	8,315.79
Net profit for the year		$41,684.21
The rate of return on the invested capital of $300,000 is, therefore, $41,684.21 ÷ $300,000 or		13.8947%

The rate of return on the average invested capital for the year is:

Invested capital beginning of year	$300,000.00	
Invested capital end of year	341,684.21	
Total	$641,684.21	
Average invested capital for year	$320,842.10	
Rate of return—$41,684.21 ÷ $320,842.10 =		13.00%

No. 5 (10 points):

A corporation has outstanding $14,000,000 in 6 per cent. bonds, due in 5 years. Interest is payable annually. The corporation desires to retire these bonds by a new 4½ per cent. issue, also due in 5 years.

The brokers suggest an issue of a stated larger amount to be issued mostly to the old bondholders, the balance to be the brokers' commission. No cash is to be received or paid.

This, apparently, should result in a considerable saving in interest, but you point out to the corporation that the cost will, eventually, be about the same.

What amount of bonds did the brokers suggest?

Given: $(1.045)^5 = 1.246182$

Solution:

The proposal of the brokers, in effect, is to exchange or sell $\$14,000,000+X$ of 4½ per cent. five year bonds for the $14,000,000 of 6 per cent. five-year bonds outstanding. The bonds to be issued in the amount of X will constitute bond discount which must be written off over their five-year life. The amount of X is, therefore, that amount of bonds, which added to the $14,000,000 already outstanding, all of which are to bear a coupon rate of 4½ per cent. (interest payable annually) will not cost the corporation more than $840,000 per annum (the present interest charge of 6 per cent. on the $14,000,000 outstanding) in interest and amortization of the amount of the X bonds. The problem gives $(1.045)^5 = 1.246182$, indicating that the sinking fund to retire the additional par of bonds to be issued is to bear a rate of 4½ per cent. The annual contribution to the sinking fund may be ascertained as follows: $(1.246182-1) \div .045 = 5.4707$ which is the amount of an annuity of 1. The annual contribution is, therefore, $X \div 5.4707$.

The proposition may be stated as follows:

$$\$840,000 = .045(\$14,000,000+X) + \frac{X}{5.4707}$$

$$\text{or } \$840,000 = \$630,000 + .045X + .18279196X$$

$$\text{or } .22779196X = \$210,000$$

$$X = \$921,893.82$$

The proposed issue would approximate $14,921,893.82.

Proof

Present interest charges—6% of $14,000,000	$840,000.00
Interest at 4½% on $14,921,893.82	671,485.22

Saving to be deposited into a sinking fund and to bear interest at 4½%	$168,514.78
The amount of the saving, $168,514.78 multiplied by the amount of an annuity of $1 for five years at 4½%—5.4707	$921,893.82

While the preceding solution is based upon the assumption that the sinking fund to amortize the amount of the additional bonds is to bear interest at 4½ per cent., the argument may be advanced that the issuance of 4½ per cent. interest bearing bonds in the larger amount in exchange for the $14,000,000 of 6 per cent. bonds indicates an effective rate of 6 per cent., which rate should be used in computing the annual contribution to the sinking fund. In the alternative method which follows, this 6 per cent. rate is used.

A rather common problem is to give the candidate the par, interest rates, present values, etc., and to require the computation of the price at which the bonds are to be sold. In this problem, we have the price, i. e., $14,000,000. The proposition may then be expressed—

Price = (par times present value of 1) + present value of an annuity of 1 times coupons.

Or:

$$\$14{,}000{,}000 = (X \;.\; p) + P(X \;.\; .045)$$

Or:

$$\$14{,}000{,}000 = .74725817X + 4.21236379(.045X)$$
$$\$14{,}000{,}000 = .74725817X + .18955637X$$
$$.93681454X = \$14{,}000{,}000$$
$$X = \$14{,}944{,}259.94$$

Proof

Present interest charges	$840,000.00
Interest at 4½% on $14,944,259.94	672,491.70
Saving to be deposited into a sinking fund	$167,508.30
The amount of the saving of $167,508.30 multiplied by the amount of an annuity of $1 for five years at the effective rate of 6%—5.63709296	$944,259.94